

"IULIU HAȚIEGANU" UNIVERSITY OF MEDICINE AND PHARMACY

CLUJ-NAPOCA

FACULTY OF MEDICINE

DOCTORAL SCHOOL



UMF

UNIVERSITATEA DE
MEDICINĂ ȘI FARMACIE
IULIU HAȚIEGANU
CLUJ-NAPOCA

ABILITATION THESIS SUMMARY

**Modern approaches in the field of
forensic medicine**

Domain: MEDICINE

Author: Conf. Dr. Dan Perju Dumbravă

Cluj-Napoca 2019

INTRODUCTION

This Habilitation thesis covers all the aspects related to the author's scientific, professional and academic activity since 1996 (following the defence of his doctoral thesis) up to the present. The doctoral thesis was coordinated by Prof. Dr. Gheorghe Scripcaru, and after its defence, the author was awarded the title of Doctor in Medical Sciences.

This thesis contains the author's personal research work that was carried out in the field of forensic medicine, bioethics and malpractice. The aspects related to the necessity of developing a program for performing autopsies by imaging methods are mentioned as being among the most outstanding scientific contributions of the author; certain methods of 3-D facial reconstruction by laser scanning of the skull are also taken into account; regarding the future of his career, the author would like to implement a project that will improve the medical expertise by carrying out topical paraclinical examinations in toxicology, histopathology or immunohistochemistry.

PERSONAL CONTRIBUTION

The Habilitation thesis is structured in two parts: in the first part of the paper the scientific, professional and academic achievements of the undersigned will be presented and in the second part the future plans related to the development of a scientific, professional and academic career will be detailed. The scientific achievements presented in the first part of the paper include three chapters which refer to current issues in the field of forensic medicine, bioethics and malpractice.

Regarding the aforementioned aspects, I have identified advances and progress in medical imaging in recent years. Therefore, I have found it useful for computer programs to be implied, through forensic medicine, in the investigation process so that the criminal investigation bodies be helped with identifying missing persons or bodies. In this regard, I have found it useful, in the specialized field, to scan the bone remnants, especially the skull, followed by the 3-D reconstruction of the soft tissues of the face with little computer technology. At the global level, this technique is frequently used especially in forensics. This action consisted in the creation of an anthropology laboratory that includes the equipment and part of the disposable office supplies necessary in order to carry out this project. The first major step in starting up the process was the purchase of a Laserescaner 3-D VI 910 and a software program, trial version, for the virtual determination of soft tissues. In the Habilitation thesis we thoroughly described this process as well as the results obtained by testing the system on two skulls; in the future we will develop this project after purchasing the complete version and updating the software program.

Another research element that I have considered, from a theoretical point of view, and on which I tried to focus in order to keep up to date the forensic activity was the virtual autopsy, frequently used at present, through imaging methods and which brings essential details in solving the most controversial medical-legal cases. We have presented the benefits, limitations and implications of putting into practice such a process both in two articles, and in scientific manifestations.

The second and third chapters of the scientific achievements section include the presentation of the current issues in the field of ethics and of the medical responsibility, where legal medicine started being more and more active. In this paper, I have also presented the aspects of the research implemented in these topics, through the medico-legal interpretation applicable in legal and medical context. Medical liability which encompasses all the elements of malpractice is an increasingly common topic encountered in some aspects

related to the field of protocols and legislation in force. In several scientific papers published in indexed journals, I have outlined the elements concerning the medical responsibility that the clinician doctor should take into account in their specialized medical conduct.

Regarding the professional activity, which represents another chapter of this thesis, I have mentioned the 85 works published, in full or in summary, as lead author or co-author, out of which 12 were published abroad. Of the scientific works published as lead author, 9 specialized books in the field of forensic medicine have been mentioned in the thesis, as well as 12 books or specialized treaties as co-author or which include chapters that were produced by me. As to the published articles, we have mentioned 10 research papers published in ISI journals with impact factor, as lead author, 12 BDI indexed papers and 32 articles published in specialty journals and the Proceedings of scientific events listed as ISBN or ISSN.

During all this period I participated in numerous national and international scientific sessions and conferences, where I gradually improved both my professional experience and my teaching skills, being constantly updated with the latest discoveries and changes in the field of legal medicine and judiciary activity. An relevant point regarding my knowledge of the latest research in the forensic medicine is represented by the membership in the editorial boards of some publishers or publications. At the same time, my professional ability can also be proven by the fact that I am a member of 10 national and international scientific and professional societies, as well as of the organizing committees of several national congresses.

Other research activities include the coordination of the grant-type project on digital identification with remote transmission through mobile terminals, IDA from 2007 up to the present. Another responsibility that I was entrusted with was that of Head of the Legal Medicine Laboratory at IML, Cluj from 2001 up to the present.

Regarding the academic activity, I hold the position of Associate Professor at "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, where I started my activity in 1991. I was appointed Head of the Department of Legal Medicine in 2009, and I have held this position for the last ten years (to present). I also hold the rank of full Professor at the Faculty of Law of "Dimitrie Cantemir" University, Cluj-Napoca, where I started my activity in 1993. My teaching activity includes the teaching of legal medicine courses to medical students, resident doctors, specialist doctors, consultants, graduates from the Faculty of LMA and Midwives, courses in bioethics and medical law. My teaching also refers to giving postgraduate courses; I also have the responsibility for coordinating and training resident doctors from a professional viewpoint, and last but not least I also have the responsibility for coordinating and advising bachelor and master degree theses. It is worth noting the quality of Expert on behalf of "Iuliu Hațieganu" University of Medicine and Pharmacy, Cluj-Napoca, within the program of Postdoctoral Studies in the field of Health Policy Ethics, which is a project co-financed from the European Social Fund through the Sectoral Operational Program for Human Resources Development 2007-2013.

The development of the scientific career will follow the achievement of a major objective, namely: the completion of the 3-D facial reconstruction project by scanning the skulls, which will imply purchasing the latest software product released on the market. The research fields carried out up until now include: medical responsibility, medical ethics and the implementation of a project to update the examinations in the field of toxicology, histopathology, immunohistochemistry, in order to form a research team that will bring visibility to the university through the implemented studies.

The development of the professional career can be summarized by the continuation of the activity in the Institute of Legal Medicine and in "Iuliu Hațieganu" University of Medicine and Pharmacy accompanied by

an equally active participation in the national and international scientific congresses and sessions, in order to transmit our experience, gained in the field, to the young generation of doctors and PhD students. There is a desire to collaborate with other colleagues from other universities or institutions, in order to improve the quality of the medical act applied for legal purposes.

The major plan for the development of the academic career includes the initiation of a syllabus and specialized courses for the Doctoral School in order to train professionals in the field of medical-legal or judicial research and practice. At the same time, the objectives set so far, regarding the bachelor's, master's and postgraduate courses, will continue to look for modern technological ways to improve the act, having the same final objective of training professionals in the medical and legal field or acquiring a certain competence.

Only by training qualified and professional staff will we be able to ensure that in the future the scientific achievements will evolve even more by finding new trends in the field, and the works discovered and materialized today will remain as a cornerstone in the evolution of science.

GENERAL CONCLUSIONS

In the field of expertise, regardless of its nature, the forensic physician must present certain lesion characteristics, in a professional manner so that everybody can understand them. This presentation often helps the court to stage certain facts, to classify them, to find the culprit and the circumstances of producing the injurious event. Often, the forensic doctor by their interpretation helps to protect the interests of the patient and implicitly of their family. Thus, for example, in the case of psychiatric expertise, the assessment of the discernment may attract the patient to be interdicted with regard to the protection of their property and their legal interests.

Through their activity the forensic doctor interposes between the medical concepts, patient and justice. In this respect, they must maintain a certain professional dignity and correctness in the interpretation of the data recorded in the documents issued by them, continuously maintaining a high scientific behavior. This is what I have tried to respect and transmit in the work I did in all these years within the Institute of Legal Medicine, Cluj.

Regarding the virtual autopsy, this is a necessity in the evolution of the medical profession, or at least this is how we see it in our specialty. I need to understand that any change can ultimately be an evolution; we must understand that sacrifice, perseverance and a lot of patience are needed in order to implement a new experimental system. The benefits that the virtual autopsy can bring are far superior to the slightly increased costs and the extended work program. From a scientific point of view, this would bring many new elements, open many ways for the lesional interpretation of the bodies and perhaps explain new mechanisms for the production of certain traumatic injuries. I believe that there is a need and a strong desire for implementing a multidisciplinary collaboration and therefore, I started by taking the first step, by describing what the implementation of this concept of virtual autopsy can bring in comparison with the current system.

In the previous chapter, I have explained in detail the importance of the facial reconstruction in the identification of the bodies with the extra mention that in the forensic services the interpretation of the data must be as accurate and as concise as possible; furthermore, it is crucial that no room for interpretation be left. As collaborators we want to help solve difficult cases, often with a lot of unknown data. Thus, in 2009 we tried to implement this facial reconstruction system through 3D laser scanning, but from the practical point of view we encountered some impediments. The system has been tested and it works, but an update of the software programs has to be done which would imply high costs, which is currently difficult to cover. As I was highlighting in the case of the virtual autopsy, there is a need for collaboration in this case too; certain material and intellectual resources are also required in order to implement such a project.

Personally, I initiated this project, I helped with its acquisition and testing, I observed the results that can be reached but I believe that more active involvement is needed; in addition, my belief is that a community with a strong desire to achieve something great in the field of research is required. However, once this project has been initiated, it will need support from both the forensic institutions and the criminal investigation services.

The main research directions in the field of malpractice have focused on the clinical and medical-legal applicability of these concepts in the legal field. Over the years, I have tried professionally to make improvements in the practical application of the elements of malpractice in the forensic expertise. Starting from the medical-legal expertise specific to the medical fault realized in the Institute of Legal Medicine, Cluj-Napoca I tried to bring forward some scientific achievements by presenting exceptional cases. Although the cases of malpractice are numerous, their presentation in specialized articles is quite difficult, first of all because of the legal character where any case before the court can be made public only after the final sentence, when no more remedies are available. Thus, it takes quite a long period of time until the case is solved; in trying to produce a scientific content, from a medical point of view, that specific case aspect might lose interest in terms of novelty.

Regarding the field of the medical fault, throughout my career, I have tried to present all the aspects of this concept to residents and students alike, both from the perspective of the research or the teaching activity; they were presented as a method of prophylaxis in this chapter, for future doctors. During their medical studies in university, the young doctors must study and gain the knowledge of the elements, conditions and circumstances producing the malpractice. My teaching activity, in the postgraduate courses, has pursued a continuous development of this topic in order to present the ways in which the modern doctor must avoid illicit medical behavior. This personal approach of this field is identifiable through the publication of numerous books or chapters of books, mentioned in this chapter, in which we presented all the medical, medical-legal and legal aspects of the medical fault.

My future scientific, professional and academic career aims first and foremost to bring forward the forensic activity by aligning it with the European standards of this field. National research is an activity that requires funding, involvement and a motivated team to discover new analytical methods to improve the current system. The use of state-of-the-art technological methods, the use of innovation and the promotion of a set of educational, moral and cultural values must complete and stimulate the knowledge available to any academic. Assuming the preparation of doctoral students with the desire to improve the current system represents a challenge that, I believe, I can meet.

Based on my experience, professional competences and the skills gained during my career as a coordinator and tutor of students, masters or residents, I call for the achievement of this objective of my personal career. The articles published in prestigious indexed journals, with impact factor as well as the participation in different manifestations as a guest, the active participation in various research projects, all represent the proof of personal capabilities to meet the objectives proposed in this paper, in accordance with future opportunities and challenges. All of these constitute evidence of my personal involvement in the scientific development of the legal medicine specialty and of the related specialties.

In this course of action, I will consider maintaining and improving the relations between "Iuliu Hațieganu" University of Medicine and Pharmacy and the Institute of Forensic Medicine, Cluj in order to enhance the success chances of the proposed projects. Through these future activities I wish that I could help to increase the visibility of the Department of Legal Medicine, but also of the Faculty of Medicine and to reach the desired professional reputation before my retirement. Finally, mention must be made of the fact that one final objective that I have set is to create a united peer group at the department, a team that will be capable of carrying on the prestige of the chair, the projects and the training of high quality medical personnel.

ORIGINALITY AND INNOVATIVE CONTRIBUTIONS OF THE THESIS

The research done in the present Habilitation thesis contains elements that give it an original and innovative character, through the multidisciplinary approach of some aspects related to legal medicine and the elements of medical responsibility.

In order to find new approaches in the evaluation of medical liability cases, we consider that the inclusion of original forensic elements in this thesis offers a useful perspective on the study of the relationship between medical liability and medical expertise.

The approach of forensic autopsies by new techniques (Virtopsy) and the introduction of the 3D cranial-facial reconstruction technique, respectively, represents an original element of the present research. The results obtained in this paper encourage the continuation of the research using these techniques, as a tool that allows the analysis of the corpses/ bodies and corpse fragments by state-of -the -art means and equipment.

From the results obtained in the personal research, there is a series of data with certain implications in the current forensic practice, especially in the identification of the bodies. The presentation of the elements of medical responsibility in the personal research brings new data regarding the causes of the complaints filed against the doctors and the efficient methods of solving them.